dach and, after a longer or shorter course there, passes ventrad to the gray substance. Another portion passes directly through the substantia gelantinosa, ending in a network in the lateral cells of the anterior cornua; another portion to the column of Clarke and the posterior commissure.

The lateral group first passes longitudinally as the marginal zone of Lissauer, then ventrad through the zona spongiosa. The columns of Burdach consist of fibers from the intermediate group. The longer fibers pass from the lumbar roots to the cells of Clarke in the dorsal cord and a portion of the fibers pass from the cervical roots caudad to the same cell group, the major portion however passes to the nucleus of this column in the medulla. The Posterior Commissure contains: 1. fibers from the mesial and intermediate groups, medullated in embryos only 36 cm. long; 2. fibers arising from cells in the galatinous substance of Rolando becoming medullated after birth. One difference between these results and those of other authors is that Lenhossék traces none of the fibers from the posterior roots into the anterior commissure.

Zur Frage über Veränderungen der Nervencentren bei peripherischen Reizen. S. SSADOWSKI. Dissertation, St. Petersburg, 1889. Russisch. Rev. in Neurolog. Centralbl, No. 15, 1889, by P. Rosenbach.

The question to be solved was whether pathological changes could be induced in a ganglion by the stimulation of its peripheral nerve. The experiments were made on dogs and rabbits. Ssadowski stimulated on one side of the body, the nervus ischiadicus, vagus, auricularis magnus, or intercostalis. The stimulus was either by faradization or ligature of the nerves. In the first case the stimulus was applied for fifteen min. daily through several weeks. In the last the ligature was applied for a period of from 7—70 days. The animals were then killed and a microscopic examination made of the nerve and the associated ganglion. The nerve trunk in the neighborhood of the ligature showed evidence of degeneration; that which had been electrically stimulated did not. On the other hand, the ganglion in both cases showed atrophic degenerative changes (consisting in vacuolization, coagulation necrosis, and shrinkage) of the nerve cells, and at times infiltration with lymphoid elements and distention of the capillaries. These results are explained by the author as degeneration following disturbance of nutrition which was in time caused by excessive stimulation.

Further observations on the histology and function of the mammalian sympathetic ganglia. W. HALE WHITE, M. D. Journ. of Physiology, Vol. X, No. 5, July, 1889.

The study of the superior cervical ganglia in the human adult and comparison of it with other forms led White to conclude some time since that in man at maturity these ganglia were functionless. (See abstract AM. JOUR. PSY. Vol. 1. p. 329.) In the present paper he concludes from a study of the same ganglia taken according to the age of the subject that there is a progressive degeneration of the cells from birth on. He has further examined the semilunar ganglia in a similar way and finds the same general relations all around that were determined for the cervical. In examining the thoracic ganglia they are found much more constant in size and in general more

normal, or at least never so degenerate as the first two that were studied. He concludes as the result of his investigation up to this point: firstly, that in lower mammals and young human beings the collateral ganglia (if we may judge from the superior cervical and semilunar) are functionally active, but that in monkeys there are evidences of commencing loss of function, which has completely disappeared in the human adult; secondly, that in man the function of the lateral ganglia is maintained well into adult life and only begins to disappear in old age. It is a curious fact that in all these cases the sympathetic nerves are described as normal. The possibility of degenerate ganglia associated with normal nerves in the sympathetic system is not explained by any existing view of the relation between cells and fibers in that region and at first sight, at least, is one of the most striking results.

On the Minute Anatomy of the Vagus nerve in Selachians, with Remarks on the Segmental Value of the Cranial nerves. THOMAS W. SHORE. Journal of Anatomy and Physiology, Vol. XXIII, pp. 428—451. Plates XX—XXI.

In a former paper (noticed in this JOURNAL Vol. II, p. 309) the author gave a summary of our present knowledge of the anatomy and development of the vagus in Petromyzon, Elasmobranchs, Rana and Amniota. The present paper contains the results of the author's researches upon the microscopic anatomy of the vagus of the skate (*Raia batis* and *R. clav.*). The nerve cells of the vagus of the skate are arranged in five groups. The nerve does not contain any non-ganglionated somatic motor fibers, and there is only one small faciculus of ganglionated somatic sensory fibers, viz., the small dorsal branch. The splanchnic motor and probably splanchnic sensory fibers are well marked, and are, as in the case of a typical spinal nerve, divisible into a non-ganglionated portion, which runs chiefly in the post-branchial branches, and a small-fibred ganglionated part, which is found in the branchials and visceralis. The vagus nerve of the skate, therefore, does not contain all the elements of a single perfect spinal nerve-metamer. It contains the typical elements of the so called sympathetic system, namely, splanchnic small medullated fibers some of which join a proximal set of ganglia, others passing on to a distal set. The proximal set of ganglia are represented by the branchial and viceralis ganglia, the distal set by the pre-branchial ganglia of the skate's vagus. F. T.

A demonstration of centres of ideation in the brain from observation and experiment. BERNARD HOLLANDER. Reprinted from the Journal of the Anthropological Institute, (London,) August, 1889.

The author attempts to correlate the modern experiments of the brain physiologists with the older observations of the phrenologists. Some half dozen "organs" are thus identified with the "centres" on the general principle that the "organ" is located in the region, where stimulation of the cortex gives rise to movements, gestures or facial motions that are expressive of the feeling for which the organ stands. The method pursued in correlating the two is however unscientific. Judging by the "discussion" at the end of the paper it was nevertheless received without any severe criticism. A paper of the same import was read by the author before the Anthro-